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THIRD ANNUAL REPORT

OF THE

STATE INSPECTOR OF MINES

TO THE

GOVERNOR OF WEST VIRGINIA,

FOR THE

YEAR 1885.

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ANNUAL REPORT.

SEWELL DEPOT, FAYETTE CO., W. VA.,
May 15, 1886.

To His Excellency, E. W. WILSON,
Governor of West Virginia :

SIR :—I herewith transmit you my report as State Inspector of Coal Mines, for the year 1885. I assumed the duties of the office on the 15th day of July, and was therefore in office only five and a half months during the year, and the descriptions of the mines given in this report of course covers only that period ; but *all* the accidents that occurred in or about the mines during the *entire* year, so far as I have been able to ascertain, are reported under the proper dates in the chapter of accidents. The lateness of this report no doubt requires some explanation. As soon as I could get matters in readiness after qualifying as Inspector, I began the work of examining the mines with the hope of inspecting all the mines of the State and completing my report by the first of January, but I found a great many of the mines to be idle or running only two or three days in each week, owing chiefly to the dullness of the coal trade, and making it necessary in some instances to visit the same mines two or three times before I found them in operation. This made the work of inspection slow, and consumed much more time than would have been required had the mines been running with ordinary regularity. True, I might have examined some of them while they were idle, which in some cases I *had* to do, so as to complete this report, but such examinations are not by any means satisfactory, for the reason that it is frequently difficult to determine correctly what the condition of a mine is, when running, by an examination of it while idle.

In addition to giving a description of the mines, the law requires the Inspector in his report to state "all accidents that may have happened in the working and operating of said mines, the number of persons, if any, working in and about said mines who have been injured or killed, the cause thereof so far as he has been able to ascertain, and all the facts at his command in relation thereto."

Now, I hardly need state that it is impossible for the Inspector to collect the facts and make a record of all the accidents occurring in the State in any one year, by or on the first day of January succeeding. The best that he can do is to collect such information when visiting the mines, and the particulars of such accidents as may occur between the time at which he last visits a mine and the end of the year, he has to rely on getting by mail from some one connected with the mine.

Toward the latter part of December I sent to each operator a blank form for the purpose of collecting with other information, a full list of all accidents and circumstances connected therewith, that had occurred during the year. A majority of these blanks were readily filled and returned, but some were returned only after a long delay and otheres have not been returned at all.

The law further requires the Inspector to make such suggestions and recommendations in relation to mines and the proper legislation relating thereto as he may deem proper and necessary.

The defects and inadequacy of the present mining law are apparent to any one familiar with mines, who takes the trouble to examine it, and it is evident that changes are needed. In this report however they will not be considered, but before the meeting of the next legislature I will submit a report in which this subject will receive due attention.

On the 21st of January, 1886, in the Mountain Brook shaft mine at Newburg in Preston county, occurred the most disastrous explosion of fire-damp that has ever happened in the mines of West Virginia. The particulars of this accident will be given in full in the report for 1886.

In the arrangement of the mines I have begun at the most northerly one in the State (Wellsburg Shaft Mine), and placed them in succession as they would be found in advancing southward along the Ohio River Road to Wheeling, thence along the Baltimore and Ohio Railroad to Piedmont, and from Piedmont along the West Virginia Central and Pittsburg Railroad to Davis. Then beginning at Grafton, they are arranged as they are found along the Parkersburg Branch of the Baltimore and Ohio Railroad to the Ohio river, and down the Ohio to the mouth of the Great Kanawha, thence up the Kanawha and New rivers to the mines in Mercer county. This arrangement is believed to be more convenient for reference than the usual one by counties, which is frequently adopted by inspectors.

Very Respectfully,
H. J. TUCKER, *Inspector of Mines.*

NOXIOUS GASSES OF MINES.

The principal noxious gasses encountered in mines are, black-damp, (carbonic accid gas) fire-damp, (light carburetted hydrogen gas) white-damp, (carbonic oxide gas) stone-damp, (sulphuretted hydrogen gas) and after-damp, or the result of an explosion of fire-damp.

Black-damp is more frequently found in mines than any other of the noxious gasses. It is produced by the breathing of men and animals, the burning of lights, the explosion of powder in blasting, and the decay of organic matter, and it is sometimes given off in large quantities naturally, by some mines. It is a little more than one and a half times as heavy as common air, having a specific gravity of 1528, that of air being taken at 1000, and therefore it has a tendency to seek the lowest points, and when not diffused through the atmosphere, will be found if present, next to the floor of mines. It frequently exists in old and abandoned workings that have been stopped off and thus deprived of ventilation, making such places dangerous to explore. It is not an explosive gas, but on the contrary a light placed in air containing ten *per cent.* of it will be extinguished. Air containing eight *per cent.* of it will not support human life, and when it is breathed in much smaller quantities it will gradually undermine the health.

Black-damp can readily be detected by the flame of an ordinary mine lamp, which burns dimly or becomes extinguished according to the proportion of black-damp present; or when a smaller proportion is mixed with the air, a quick movement of the lamp is more liable to extinguish it than it would be in ordinary air.

Fire-damp is generally found in deep mines, though it is occasionally found in dangerous quantities in drift mines. It is given off from the coal seams and from the roof and floor of mines, and is about one-half as heavy as common air, bulk for bulk. When it is given off by a mine and is undisturbed by the ventilating current, it always accumulates in the highest cavities of the roof. It is the most dangerous of all mine gases, for when it is mixed with common air in the proportion of one part of fire-damp to nine or ten parts of air, in large bodies, and fired by the blaze of a naked lamp or otherwise, it produces a terrific explosion, tearing out doors, stoppings, props and brattices and driving them together with mine cars and every other movable thing along the gangways, where they are often left a total wreck. Such a mixture of fire-damp and air when fired is said to produce about eight times its own volume of flame. After an explosion there is left a hot poisonous gas known as after-damp, which soon causes death to all persons left to breathe it, who may have escaped death from the shock and fire of the explosion.

Pure fire-damp will not support combustion but will extinguish a light placed in it, and it requires to be mixed with air in proportion of about five or six parts of air to one of fire-damp before it becomes explosive. As more air is added the explosive force increases until there are nine or ten parts of air to one of gas, when the mixture is at the greatest explosive point. As the proportion of air is made greater beyond this point, the explosive force is weakened until there are about fifteen parts of air to one of gas, when the mixture again ceases to be explosive.

While, however, a mixture of one part of fire-damp to fifteen parts of pure air is not explosive, still in numerous experiments by mine commissioners and others. it has been found that where the atmosphere contains only two *per cent.* of fire-damp (a quantity too small to be detected by any ordinary means) and is charged with fine dry coal dust, it may, when fired give rise to explosions. If the atmosphere of a mine contains about three *per cent.* or more of fire-damp, its presence can be detected by lowering the flame of a lamp, shading it with the hand and slowly elevating it toward the roof, keeping in sight only the extreme top of the flame, when, if the gas be present, a halo or cap just over the flame will be visible and the flame will be perceptibly elongated. When dangerous quantities of gas are liable to exist, examinations should always be made with a safety lamp.

White-damp appears to rarely exist in mines in dangerous qantities, except as the result of mine fires or the fires of mine locomotives or boilers. It is however also produced in small quantities by blasting. The breathing of air containing three *per cent.* of this gas causes death. It is difficult to detect except by its peculiar odor.

Stone-damp or sulphuretted hydrogen, is a poisonous gas but it is rarely found in mines, though it sometimes exists in old, wet and unventilated workings. It may readily be detected by its peculiar odor, resembling that of rotten eggs.

VENTILATION OF MINES.

The object of mine ventilation is to dilute and drive out the various noxious gases that might accumulate in the mine, and to supply fresh air for the workings. It is a matter of the greatest importance to all persons employed in mines and should receive unceasing attention from every one having charge of underground workings.

The statute of this State does not name the quantity of air that should be circulated, but merely says that each operator shall provide a proper and sufficient system of pure air ventilation, which shall be circulated, &c. It is true that some mines should have much more air than others, the amount required being dependent on the degree of vitiation of the current by the breathing and perspiration of men and animals, the burning of lights and powder, and the quantity and kind of gases that may be encountered; but it is generally admitted I believe, that in mines giving off no fire-damp there should be circulated at least one hundred cubic feet of air per minute for each person employed inside the mine. If fire-damp is given off, it may be necessary to increase this quantity to a much greater amount, dependent of course on the quantity of fire-damp that the mine produces. Every mine boss should understand the general principles of ventilation and be able to appreciate the difference in friction in passing a certain quantity of air per minute through airways of different sizes, and to estimate the extra friction engendered by forcing the whole current of his mine through a break-through of only a few feet sectional area, or one nearly filled with debris; defects frequently noticed in some of the mines of this State.

NATURAL VENTILATION.

Air has weight which changes as its density varies. It expands when heated at the rate of 1-459 of its volume at zero, for every degree of heat added; or, perhaps a little more clearly, 459 cubic feet of air at zero will, when subjected to a constant pressure, increase in bulk one cubic foot for each degree of heat added to its temperature. As it expands it of course becomes proportionately lighter, bulk for bulk.

Now if we were to take for consideration the case of a mine dependent on natural ventilation, with two openings, one considerably higher than the other, and connected by the under-ground workings; and suppose that the temperature out-side is at zero while the temperature of the inside of the mine is 60 degrees above zero, it is clear from the principle above stated, that 459 cubic feet of air outside of the mine, would then be just as heavy as 459+60=519 cubic feet of the warmer and rarer air inside the mine; and it is also clear that the outside air being heavier bulk for bulk than that inside, would enter at the lower opening and force the lighter air up and out of the mine through the higher opening. The cold air on entering the mine, would in turn become heated, thus maintaining a constant current or draught through the mine so long as the difference of temperature were maintained; but, if the outside temperature were gradually raised while that inside the mine remained stationary, the current would gradually become weaker until they would become equal, when all current would cease. If the outside temperature were raised above the inside temperature, the current would reverse, the inside air being the denser and heavier, and the draught would be from the higher to the lower opening. But, if instead of the two outlets being at different elevations, they were drift openings, and nearly on the same level, there would be but little ventilation however much the outside temperature might differ from that inside. Sometimes the wind materially assists natural ventilation but at other times it may blow in a direction opposed to the natural current through the mine, and coming in irregular gusts, may cause the air to baffle backward and forward. Thus we see that natural ventilation is not very reliable at the best, and it is to be hoped that in the near future every large mine at least, in the State may have some artificial means of maintaining a constant current of pure air through its workings.

ARTIFICIAL VENTILATION.

The usual artificial methods of supplying mines with air, are by centrifugal fans, furnaces, steam jets and exhaust steam from pumps. Fans are generally preferable in positions that are favorable to their adoption, such as slope or shaft mines where steam is used for hoisting the coal. In such positions its superiority over the furnace in points of economy and safety are apparent, as steam for driving the fan can be obtained from the boilers that create the steam for hoisting the coal, the cost of attending a furnace and the coal used in firing it are saved, and if the mine gives off fire-damp, the danger of passing bodies of gas over a furnace is avoided. They are used at some mines to force air into the mine and at others to exhaust or draw it out. Opinions differ as to the relative merits of each method, and reasons are advanced on both sides that are worthy of consideration; but it appears that the balance of opinion is in favor of the exhaust fan, and in a majority of instances they are thus used. In either case the course of the air though the fan is always from the center to the periphery. At shaft mines it would always be well to provide the fan with doors, so arranged that the direction of the current through the mine may be occasionally reversed in cold weather, and the down cast cleared of ice; and in case of fire breaking out at the down cast, by reversing the current, the ventilation might be kept up without drawing the smoke and gases from the fire through the workings. Furnaces are much more generally used in this State than fans, and will probably continue to be for many years to come; a large majority of the mines being drifts and situated high up on the sides of mountains where water for producing steam cannot at certain seasons of the year, be readily procured. Such mines being usually free from fire-damp, the use of furnaces is not objectionable, and when they are well made and properly attended they maintain a steady and reliable draught.

Steam jets are occasionably used, but their use costs much more in proportion to the amount of air obtained than either the fan or furnace, and generally where steam can be supplied for jets it may be more economically used in driving a fan. For temporary use, however, they are often valuable.

EXAMINATION OF MINES.

WELLSBURG SHAFT MINE

Diamond Coal & Coke Co., operators, is at Wellsburg, Brooke county, on the line of the Pittsburg, Cincinnati and St. Louis Railroad. This mine was idle at the time of my visit (November, 11,) and the superintendent informed me that there were no prospects of its resuming operations before next spring. I however went through a part of the mine. The shaft is 243 feet deep and is divided into a hoisting department and an upcast for ventilation. There is a ventilating furnace with 48 square feet of grate surface, which was not fired up at the time, but the heat and exhaust steam from the pump, combined with natural causes, were producing a current of air measuring 16,000 cubic feet per minute at the bottom of the upcast.

WELLSBURG MINE

Is a short distance below Wellsburg Shaft Mine, on the P. C. & St. L. R. R., and is operated by Forbes, Carmichael & Co. The drainage was by syphon and was good. Ventilation is maintained by a furnace four feet across the bars, three feet from bars to arch, and six feet long, at the bottom of a shaft and stack fifty-two feet high and three feet inner diameter. The ventilation was very good with the exception of one or two working faces that were too far in advanc of the air current.

SHORT CREEK MINE,

Operated by James Cooper & Co., is also on the line of the Pittsburg, Cincinnati and St. Louis R. R., seven miles below Wellsburg. A heading had been driven entirely through the hill in which the mine is, and the ventilation at the time of my visit was good, though no artificial means was used to produce it. The drainage was not good and the attention of the superintendent was directed to the matter, which he agreed to remedy. He has since written me that the drainage has been improved and that the condition of the mine in that respect is good.

TOP MILL MINE,

Is situated in the northern part of Wheeling, opposite Martin's

Ferry, and is operated by the Wheeling Iron and Nail Co. I did not examine the mine as I was informed they employed only fourteen miners, and that they did not in future, expect to employ as many as fifteen, at one time.

FULTON MINE

Is operated by Marshall, Van Fossen & Co., who informed me that the mine was idle, that they did not know when operations would be resumed and that they expected to employ only twelve miners in future.

ELM GROVE SHAFT MINE

Is at Elm Grove, four miles from Wheeling, on the Wheeling and Pittsburg branch of the Baltimore and Ohio Railroad, and is operated by W. T. Chambers & Co. The ventilation is produced by steam jets and was insufficient at the time of my visit, while the air courses were neglected and in some places nearly filled up with slate. I directed the superintendent to have the air courses cleaned out and the mine put in order.

MANCHESTER MINE

Was not in operation, and I was informed that only twelve miners were employed when it was running and that they did not expect to employ as many as fifteen miners when operations would be resumed. The operators are the Manchester Coal Co.

WHITAKER MINE

Is operated by the Whitaker Iron Co. The ventilation is produced by fan ten feet in diameter, made by Crawford & McCrimmon, of Brazil, Indiana, which gave an ample amount of air and the ventilation was good.

CRESCENT MINE,

Operated by Kaseley & Brooks, employed only fourteen miners and was not inspected.

BELMONT MINE

Is operated by the Belmont Nail Co. Ventilation is produced by furnace five feet across the bars, four feet from bars to arch which is thirty-eight feet long, at the bottom of a shaft and stack ninety feet high, and gave 5,040 cubic feet of air per minute. The ventilation was fair and the drainage good.

RIVERSIDE MINE

Is about one-fourth mile below the *Belmont mine* and is operated by the Riverside Iron and Steel Co. Ventilation is by furnace with twenty-eight square feet of grate surface, at the bottom of a shaft ninety-six feet deep. The mine was not running full time when I examined it and the furnace was only partially fired up. The ventilation however appeared to be fair. The drainage was good.

LA BELLE MINE,

Operated by the La Belle Iron Works, was employing only four or five miners as I was informed by the clerk, and no inspection was made.

SOUTH SIDE AND LA GRANGE MINES.

These mines were not running and the operators, Messrs. Kaseley & Brooks, stated that they had no idea as to when they would start up.

BOGGS RUN MINE

Is on the Baltimore and Ohio Railroad, a short distance south of Wheeling. Ventilation is by furnace and was not good, besides, some of the headings were driven too far ahead of the air current. The furnace passed 3,600 cubic feet of air per minute, which would have been sufficient for the number of men employed provided it had been properly conducted through the workings.

BENWOOD COAL WORKS MINE

Employed only eight miners, two drivers and one track man inside, and was not inspected. It has a furnace for ventilation.

BENWOOD IRON WORKS MINE

Is on the line of the Baltimore and Ohio Railroad at Benwood. It is operated by the Benwood Iron Works Company. The mine had been idle five months at the time of my visit, and I was informed that there were no immediate prospects of starting up. It has a ventilating furnace.

In this mine on the 18th day of September there occurred an explosion of fire-damp, resulting in the death of the mine boss, Joseph Hogh, William Honney and Christian Winnecke.

It is supposed that a door for directing the air had been left open, thus depriving a part of the mine of proper ventilation and permitting the fire-damp to accumulate. At about 2 o'lock in the afternoon of the day above stated, these parties entered the mine for the purpose of bailing water, and walked into the body of gas with open light. Had the ordinary precaution of examining the mine for fire-damp with a safety lamp been taken, which under such circumstances, in mines known to generate fire-damp *should never be neglected*, the accident would not have occurred.

MOUNDSVILLE SHAFT MINE,

At Moundsville, is operated by the Moundsville Coal Company. The shaft is one hundred and fifty-three feet deep, and is divided into a hoisting department (which also serves for an upcast), and a down cast for purposes of ventilation. The mine is ventilated by a Crawford & McCrimmon fan ten feet in diameter, which forces the air through the mine and is capable of producing a current of over eighteen thousand cubic feet of air per minute at the foot of the down cast. The air is divided into two uplifts and thus conducted through the workings. The drainage is by one Blake pump with a capacity of fifty gallons per minute. Both the ventilation and drainage were found to be good. This mine has no escapement shaft, and I have directed the superintendent to sink one which he promises to do.

WEST FAIRNONT SHAFT MINE

Is on the line of the Baltimore & Ohio Railroad, a short distance west of Fairmont. It was operated by the West Fairmont and Marion County Consolidated Gas Coal Company, but it has been idle for several months, and there appears to be no certainty as to when it will start up again. The shaft is one hundred and twenty-five feet deep. Ventilation is produced by exhaust steam and heat from the pump.

PALATINE MINE

Is located on the east side of the Monongahela river, a short distance above Fairmont and on the line of the Baltimore & Ohio Railroad. It is operated by the Newburg Orrel Coal Company. The ventilation and drainage were both good at the time of my visit, though no artificial power was used to produce the former. There are several openings or outlets to the mine.

GASTON MINE

Is operated by the Gaston Gas Coal Company, and is on the west side of the West Fork of the Monongahela River. A pump is used for drainage while the ventilation is produced by steam jets which passed 8,620 cubic feet of air per minute ; but owing to leakage in some of the stoppings a part of the mine was not well ventilated. There is a standard gauge railroad one and a-half miles long from the mine to the line of the Baltimore & Ohio Railroad with which it connects.

NEW ENGLAND MINE

Is located on the east side of the West Fork River, directly opposite the Gaston mine and is operated by the New England, Fairmont and Western Gas Coal Company. This is a new mine, having been opened last summer. The ventilation was natural, but the condition of the mine was fair at the time of my examination. A branch railroad has been built from the line of the Baltimore & Ohio Railroad to the mine for the shipment of coal.

IRONDALE MINE

Is a slope mine, on a branch railrord, one and a fourth miles from the line of the Baltimore & Ohio Railroad, and about ten miles East of Grafton. It is operated by F. Nemegyei.

Ventilation was by heat given off from the pump at the foot of the slope, and from the steam pipes leading down the slope from the boilers to the pump, but the current of air produced by this means was not sufficient for the requirements of the mine. I directed that a more effective means of ventilation be adopted, and suggested a fan for the purpose. A short time afterward I received a letter from the operator stating that the mine was closed a few days after my visit, and that it would not again be opened before next spring when everything would be put in good order.

In addition to this mine, Mr. Nemegyei owns fifty-one coke ovens, an iron ore mine and a blast furnace with fine facilities for the production of pig iron.

MOUNTAIN BROOK SHAFT MINE,

Operated by the Newburg Orrel Coal Company, is on the line of the Baltimore & Ohio Railroad, at Newburg, thirteen miles east of Grafton. The shaft is three hundred and fifty-five feet deep and is divided into an up cast and a down cast; the latter being used for hoisting. Ventilation is maintained by exhaust steam from the pump at the bottom of the upcast where there was passing 10,140 cubic feet of air per minute, but some of the doors and stoppings were not sufficiently close, to which I directed the attention of the superintendent. The mine gives off fire-damp quite freely at times. I instructed him to make the doors self-closing and to make other improvements at the mine that would tend toward greater safety. The mine is drained by two pumps; one a small pulsometer pump and the other a cataract pump with a capacity of seven hundred and fifty gallons per minute.

NEWBURG MINES

Are about two miles from Newburg and are operated by the same company that operates the Mountain Brook shaft mine. There are three of the mines only, one of which was inspected; the other two not employing the requisite number of mines to be within the provisions of the mining act. In the mine inspected, the ventilation was fair through no artificial power was used to produce a draught. The drainage was good. The coal is drawn over a narrow gauge railroad, one and one half mile long, by a locomotive engine, to the head of an incline plane and lowered to the tipple on the B. & O. R. R. This mine is nearly worked out.

DAVIS MINE.

Operatored by H. G. Davis & Bro., is on the line of the W. Va. C. & P. R. R., fifty-seven miles from Piedmont. The mine is a new one, and the workings are not yet very extensive. Ventilation is natural and was tolerably only fair.

FLEMINGTON MINE

Is on the Parkersburg branch of the Baltimore and Ohio Railroad and is owned by the Taylor County Coal Co. It has been idle for two years and was not inspected.

TYRCONNEL MINES, NOS. 1 AND 2,

Are on the Parkersburg branch of the B. & O. R. R., eleven miles west of Grafton, and are operated by the Newburg Orrel Coal Co. Ventilation was natural but fair, and the drainage very good.

OCEAN MINE,

Three miles east of Clarksburg on the Parkersburg branch of the B. & O. R. R. is operated by the Consolidated Coal Mining Co. The condition of the mine as to drainage was good, but the ventilation was very poor, and some of the miners were working beyond the air. I instructed the superintendent as to the condition of the mine and the needed improvements, and directed that it be put in order. Near this mine is the Murphy's Run mine which was not in operation.

DESPARD MINE,

Operated by the Despard Coal Company, is one and a half miles east of Clarksburg. The drainage of this mine is excellent. The ventilation at the time of my visit was good, notwithstanding the fact that no artificial power is used to produce an air current. This is quite an old mine and the workings are now about one mile into the hill from the mouth of the mine. An air shaft has been sunk from the surface to the present workings, and I found the current of air at the intake to measure 9,200 cubic feet per minute.

HARRISON COUNTY MINE

Is at the east end of Clarksburg. The ventilation was natural but fair at the time of my visit, but the drainage was not good, the result of working rooms to the dip of the coal seam under a leaky roof. The operators are the Harrison County Coal Co.

PINNICKINICK MINE

Employs eight miners and two drivers inside, and was not inspected.

AUSTEN MINE,

Operated by Colgate & Co., is three and a half miles east of Newburg and on the line of the B. & O. R. R. The ventilation was natural but it was fair; there is a small furnace which can be used whenever natural causes fail to produce a sufficient draught of air through the mine. The company has sixty-two coke ovens at this mine.

ARMSTRONG MINE

Is on the West Virginia Central & Pittsburg Railroad, nine miles from Piedmont, and is operated by the Big Vein Coal Co. The mine is near the top of a high knoll, has several outlets, and the ventilation at the time of my visit, though natural, was ample.

ATLANTIC MINE

Is about three miles from Armstrong Mine, on a branch of the West Virginia Central & Pittsburg Railroad. It is operated by the Atlantic & George's Creek Consolidated Coal Co. The ventilation was natural and insufficient, and some of the working faces were too far in advance of the break through. The seam is a thick one being about twelve and a half feet, and it would not be difficult to secure ample ventilation. I instructed the mine boss as to the needed improvements, and not seeing the superintendent I wrote him November the 16th.

ELK GARDEN NO. 1

Is operated by the West Virginia Central and Pittsburg Railroad Co., and is situated on a branch of their road, thirteen miles from Piedmont. Ventilation is by furnace which was passing 28,300 cubic feet of air per minute, and the mine generally was in good working order. The coal is drawn, in the mine cars, by a locomotive engine, over a narrow gauge railroad, one and one-fourth miles long from the mine to the head of an incline plane and lowered to a tipple, where it is transferred to the W. Va. C. & P. R. R. cars for shipment. This mine and the last two above described are worked in what is known as the "Big Vein" of the Cumberlain or George's Creek (Maryland,) coal field, which here varies in thickness from twelve to fourteen feet. The Elk Garden Mine No. 2 was not in operation.

ELK GARDEN MINE NO. 4

Is at Thomas, on the W. Va. C. & P. R. R., fifty miles from Piedmont and is operated by H. G. Davis & Brother. This mine was not within the provisions of the mining act, there being only thirteen persons employed inside. The seam measures about eight feet of which five and a half feet are worked.

FARLAND'S MINE

Employs only about seven or eight miners.

WILSONBURG MINE.

This mine closed down April 17th, and at the time of my visit, October 23, was still idle.

NOTE:—There is a number of small mines on the Parkersburg branch of the Baltimore and Ohio Railroad, between Clarksburg and Parkersburg, that do not employ a sufficient number of miners to come within the provision of the Mining Law; among which are:

Patton's mine, at Clarksburg, employing six miners, two drivers and one trackman;
Wolf Summit mine, employing six or eight miners;
John Obrien's mine, employing eight miners;
Volcanic mine, employing three miners.
Pugh's mine, employing five miners and one driver; and
Richie mine, employing five miners and one driver.
The last four mines are near Volcano Junction.

NEW HAVEN MINE

Is a slope mine, located on the Ohio river a short distance above New Haven, Mason county, and is operated by the New Haven Coal and Salt Co. Ventilation is by furnace power and was fair, though some of the air doors were leaky and needed repairing. The drainage was not good, as most of the entries were wet and muddy and there was considerable water in the return airway, contracting the passage.

HARTFORD CITY MINE

Is on the Ohio river, between New Haven and Hartford City, and has two slopes; one at the latter and the other at the former place, each of which is used for hoisting coal out of the mine. It is operated by the Hartford City Salt Co. Ventilation is by furnace and was fair. The mine is drained by a Pulsometer pump with a capacity of one thousand gallons per minute.

CALIFORNIA MINE

Is a new slope mine in the second hill back from the Ohio river, the old mine being worked out. Ventilation was good, and was produced by a fire at the bottom of a shaft sixty-two feet deep, on top of which was a board stack thirty-five feet high. The air entering the bottom of the upcast measured by Anemometer 9,720 cubic feet per minute, and it was well conducted through the workings. The drainage was good. The slope is 310 feet long. Operators: The Juhling Coal Co.

SEHON MINE.

At the lower end of Hartford City, is the Sehon Mine, operated by C. A. Bettinger & Co. The condition of this mine was not good. The ventilation in a part of the mine was poor, the roads were wet and sloppy, and there were several pieces of dangerous slate over head in the entries. The managers were notified and directed to put the mine in order. It is ventilated by furnace power.

MOSQUITO MINE

One-fonrth mile below the Sehon Mine, on the Ohio river, is operated by the Liverpool Salt Co. Venilation is by furnace which was passing 3,000 cubic feet of air per minute. This would have been ample for the number of miners employed, but not half of the quantity was conducted to the head of the workings. The drainage was fair.

GERMAN FURNACE MINE

Employed thirteen miners and two drivers, when running but it was idle at the time of my visit.

HOPE MINE

Employed only fourteen miners, and was not inspected.

STERLING MINE

Is located at Clifton on the Ohio river and is operated by W. E. Edwards. The ventilation was tolerably fair generally, and the rooms were well drained but along the entries the drainage was very poor. I directed that the ventilation be improved and the mine properly drained.

CLIFTON MINE

Is at the lower end of Clifton, on the Ohio river, and is operated by the Maxwell Manufacturing Co. This mine is nearly worked out. There is a small furnace for ventilation which was fair. The drainage on the entries was poor.

NEW CASTLE MINE

Is on the Ohio river one and a half miles below Clifton. The operators are Huggins & Co. This is a small mine and is dependent on natural ventilation. The drainage was not good in part of the mine.

CAMDEN MINE

On the Ohio river, four miles below Pomeroy, is operated by the Consolidated Coal and Mining Company. The ventilation and drainage of this mine were both good, the former was produced by a furnace which was passing 9,000 cubic feet of air per minute.

ENERGETIC MINE

Is located on the Ohio Central Railroad, about five miles above Winfield, on the Kanawha river. Anderson & Short are the operators. It is a new mine, and at the time of my visit employed only four or five miners. It was not inspected.

STAR (RAYMOND) MINE.

This mine has not been in operation during the last six months, and has not been inspected.

PERFECTION NO. 1 MINE

Is situated on a branch of Davis' creek, and is operated by the Black Band Iron and Coal Co. There is a standard guage railroad thirteen miles long, from a point on the Chesapeake and Ohio Railway, a short distance east of Spring Hill station to the mine. The ventilation is by furnace which was passing 5,150 cubic feet of air per minute. The drainage was good.

PERFECTION NO. 2 MINE

Is about 500 feet south of No. 1 mine, with which it will soon be connected by the underground workings. The ventilation was excellent, and was produced by a furnace four and a half feet wide and four feet high at the bottom of a shaft thirty feet deep, on top of which is a stack thirty feet high, which was passing a current of air measuring 8,450 cubic feet per minute. The drainage was good.

DANIEL BOONE MINE

Is on the north side of Kanawha river, three miles above Charleston. Only twelve miners were employed.

PIONEER MINE, NO. 1,

Is a slope mine on Campbell's creek, five miles above Charleston, and is operated by the Pioneer Coal Co. This mine was nearly worked out at the time of my inspection, (Aug. 4th,) and the superintendent stated that he expected to abandon it within two or three months. Ventilation was by furnace, but it was insufficient for the number of miners employed.

PIONEER MINE, NO. 2,

On Campbell's creek, about one-fourth mile above No. 1, is also a slope mine, and is operated by the same company that operates No. 1. The air measured at the furnace 4,500 cubic feet per minute, and at the head of the workings 2,100 cubic feet per minute, while there were employed in the mine thirty-five miners, five drivers, one trapper, two trackmen and six mules. The drainage was good. This mine, like No. 1 mine, is nearly worked out and will soon be abandoned.

PIONEER MINE, NO. 4,

Is also a slope mine operated by the same company that operates Nos. 1 and 2 mines, and is situated on the Coal Fork of Campbell's creek, one and a fourth miles above No. 2 mine. It is a new mine, was opened last summer and the workings are not yet very extensive, consisting of entries only, on which no rooms had been turned at the time of my visit. A shaft has been sunk for a furnace. There is a three and a half feet gauge railroad, three and a fourth miles long, running from the mine past Nos. 1 and 2 mines, to the company's tipple on Kanawha river. Over this road the coal is drawn in the mine cars by a nine-ton locomotive engine.

BOYCE MINE

Is located on Campbell's creek, about one-fourth mile above the No. 2 Pioneer mine, and is operated by the Campbell's Creek Coal Co. The general condition of this mine was very good. It has a ventilating furnace which was passing a current of air that measured by anemometer 12,375 cubic feet per minute. The doors and stoppings were close, conducting the air well up to the heads of each set of butt entries.

CALDERWOOD MINE

Is operated by the same company that operates the Boyce mine, and is located about one-fourth mile above it, on the south side of Campbell's creek. It is ventilated by furnace and was in fine working order. The coal from this mine and the Boyce mine is transported to the company's tipple on Kanawha river, over a standard gauge railroad on which two locomotive engines are used.

DANA BROTHER'S MINE

Is a slope mine on the north side of Campbell's Creek, opposite the Calderwood mine. It is operated by Dana Brothers. This mine has an excellent furnace sixty feet wide, four feet from top of bars to arch and forty-five feet long, at the bottom of a shaft, forty-six feet deep, on top of which is a stack ten feet high, which gave 20,800 cubic feet of air per minute, while at the heads of the various sets of butt entries there were passing quantities, ranging from 7,150 to 13,000 cubic feet of air per minute.

BEANS' MINE

Is operated by the Welton Coal & Salt Co. It is a slope mine, located on the south side of Campbell's creek, about three-forths of a mile from the company's tipple on Kanawha river. There is a furnace six feet wide, five feet high and twenty feet long, at the bottom of a shaft twenty feet deep, on top of which is a stack twenty feet high. The quantity of air passing per minute was found to be 15,120 cubic feet, but when a door was opened, supplying the furnace with air directly from the intake about 500 feet from the mouth of the mine it increased to 2,520 cubic feet per minute showing a difference of 5,400 cubic feet or a loss of over twenty-five per cent due to friction in traveling through the mine. The ventilation was fair, and the drainage was good.

DICKINSON'S MINE,

A short distance above Malden, is operated by John Q. Dickinson & Co., and employs from nine to twelve miners.

BENNINGTON MINE

Is operated by W. S. Carkin and is on the south side of Kanawha river, one and a half miles above Malden. This mine has done but little of late and was not in operation at the time of my visit.

WINIFREDE MINES, NOS. 1, 2 AND 3,

Are on the head waters of Fields creek, and the operators are the Winifrede Coal Co., of Philadelphia, Pa. Mines Nos. 1 and 2 are each ventilated by a furnace which gave a fair current of air along the entries but some of the rooms were driven several hundred feet without break throughs in the pillars to premit the air to sweep near the working faces. I directed that the break throughs be made which I have since heard has been done. In parts of these mines the drainage was not very good.

No. 3 is a new mine just opening, and at the time of my visit (August 13th,) employing sixteen miners in driving entries, but no room had been turned. A ventilating furnace was being built which they expected to complete in about one month from the above date. There is a standard guage railroad five and one-half miles long, from the mines to the company's tipple on Kanawha river, and connecting with the Chesapeake & Ohio Railway, at Winifrede Junction.

MACFARLANES' MINE,

Operated by the Macfarlane Coal Co., is on the north side of Kanawha river, opposite Winifrede Junction. When I visited this mine it was just starting up after an idleness of several months and its condition was not good. A Crawford & McCrimmon fan had been purchased for ventilating the mine, but it had not been placed in position to work.

PEERLESS MINE

Is on the south side of Kanawha river one mile above Winifrede Junction. It is operated by the Peerless Coal Company. The condition of this mine was poor. There was a small furnace but it was practically worthless for the purposes of ventilation and the air-way leading to the furnace, originally very small, was almost closed up in places by fallen slate; consequently the mine was dependent on natural ventilation and the supply of air obtained in this way was inadequate for the wants of the mine. The drainage in part of the mine was no better than the ventilation. I directed that the mine be put in order.

STEVENS COAL CO'S. MINE

Is on the Kanawha Railroad, on the Long Bottom branch of Cabin Creek. The mine consists of two openings, one of which is worked on the double entry, and the other on the single entry plan. They are small openings and were in fair working order.

There are several other small mines on the Kanawha Railroad near the Stevens Coal Company's mine, but they were not in operation.

COALBURG MINES, NOS 1 and 2.

The Robinson Coal Company, operators, are at Coalburg on the C. & O. Railway. No. 1 is quite an old mine having been opened prior to the late war, and operated by the Kanawha and Ohio Coal Co. The condition of these mines was generally fair though a good ventilaing furnace at each, especially the No. 1 mine, would be a commendable improvement and I suggested that it be built. The openings are about a half mile apart. but the coal from both mines is hauled to the mouth of No. 1 whence it is lowered over an incline gravity plane, 1,100 feet long, to the tipple on the Chesapeake and Ohio Railway and Kanawha river.

EAST BANK MINE

Stuart M. Buck, operator, is one mile above Coalburg. It is ventilated by a furnace which gave a fair amount of air for the number of inside employes. Three Harrison Coal Cutting Machines are used in this mine and are driven by compressed air. There are two tipples, one on the C. & O. Ry. and one on Kanawha river.

BLACKSBURG MINE

Is two and a-half miles above Coalburg on the line of the Chesapeake and Ohio Railway, and is worked in what is known as the Cedar Grove seam, which here averages about three feet in thickness. The condition of the mine both as to ventilation and drainage at the time of my visit was good; the former was maintained by fire basket at the bottom of a shaft twenty feet deep, on the top of which was a stack twenty-five feet high, which was passing 4,100 cubic feet of air per minute. The operator is William Sharpe.

NORTH COALBURG MINE

Is operated by the Lovell Coal Company and is situated on the north side of Kanawha river opposite Coalburg. Two mine shave been opened here on the face of the mountain, in different seams, one above the other, but only the upper one is operated at present. It is a new mine and is dependent on natural ventilation but the workings are yet very limited.

PEABODY MINE

Is on the north side of Kanawha river, about one mile above North Coalburg mine, and is operated by the Peabody Coal Company. The drainage of this mine was very good, while the ventilation which is produced by furnace five feet wide, three feet from grate to arch and nine feet long was fair.

CEDAR GROVE MINE

On the north side of Kanawha river, three-fourths of a mile above the Peabody mine, is operated by the Cedar Grove Mining Company. A part of the mine is ventilated by a furnace six feet wide, three feet high and twelve feet long, at the bottom of a stone stack, thirty feet high. The other part of the mine is dependent upon natural ventilation and has an entry driven entirely through the mountain. The general condition of the mine, both as to drainage and ventilation was fair, though in some places the air courses required cleaning out.

KELLY'S CREEK MINE

Operated by the Cedar Grove Pure Coal Company, is also on the north side of Kanawha river, opposite Blacksburg, and three-fourths of a mile above Cedar Grove mine. The drainage was good and the ventilation fair, but some of the air doors needed fixing so as to conduct the ventilating currents in greater volume to the head of the workings. There is a small furnace which was passing 3,500 cubic feet of air per minute.

CROWN HILL MINE

Is situated about one mile below Paint Creek Station, on the Chesapeake and Ohio Railway, and is operated by the Crown Hill Splint Coal Company. This mine was in good working order. Ventilation is produced by a furnace five feet four inches across the grate, three and a-half feet high from grate to arch, and fourteen feet long, and was passing 10,915 cubic feet of air per minute. The most of the mine has a strong sand stone roof, and but few props are required.

KANAWHA CANNEL COAL MINE

Is operated by the Kanawha Cannel Coal Company, and is situated on Paint Creek, about four miles from the Chesapeake and Ohio Railway and Kanawha river. It has a furnace, and the condition of the mine was fair. The coal seam at this mine has been on fire for many years, and while the area burned out is very small, still the fire occasionally breaks into the workings and is then a source of much annoyance. A narrow gauge railroad runs from the mine to a tipple on Kanawha river.

WYOMING MINES, NOS. 1 AND 2

Are not in operation and have not been inspected.

KANAWHA MINE

On the Chesapeake and Ohio Railway, one and one-fourth mile below Coal Valley, is operated by the Kanawha Mining Company. It is ventilated by furnace which gave 9,900 cubic feet of air per minute, while at the last break throughs on the various butt headings there were passing quantities ranging from 1,600 to 3,200 cubic feet per minute. Some of the rooms were driven too far without break throughs, in the pillars to permit the air to sweep nearer the working faces, and I directed that they be made. At this mine on the morning of the 26th day of May, Felix Thomas, John Pritt and Thomas Slaughter were killed, and several others injured on the incline plane in going up to the mine to work. It appears that they were riding on the empty cars that are drawn up the plane by the greater weight of the descending loaded cars, when the brake on the drum at the head of the incline, which is used for regulating the speed, became deranged, rendering the speed of the cars ungovernable, causing a runaway and resulting as above stated.

UNION MINES

Are two small mines opened in the Donnally seam, about one mile below Coal Valley and one-fourth of a mile above the Kanawha mine. They are both dependent upon natural causes for ventilation which were insufficient at the time of my visit. The old mine in the Coal Valley seam was not in operation. There are facilities for shipping coal both by rail and by Kanawha river. The Union Coal Co. were the operators, but the management has lately been changed.

MOUNT MORRIS MINE

Is on the Morris Creek branch of the C. & O. R'y, and is operated by the Mount Morris Coal Co. Neither the drainage nor ventilation of this mine was very good at the time of inspection. There was a fire-basket hung in the bottom of a stack, but it appeared to be of little benefit so far as ventilation was concerned. I directed the superintendent to provide a better means of ventilation, and suggested a furnace for that purpose, which he agreed to build as soon as a heading could be driven to the outcrop for the purpose.

CARVER'S MINE

Is on Morris creek, a short distance above the Mount Morris mine, and is on the same branch railroad. It is operated by Carver Brothers. Ventilation is by fire-basket hung at the bottom of a shaft fifty-five feet deep, on top of which is a stack sixteen feet high, giving at the bottom of this upcast 10,260 cubic feet of air per minute; and at the head of the works 4,560 cubic feet per minute.

EUREKA MINE,

At the terminis of the Morris creek branch of the C. & O. R'y, is operated by M. T. Davis & Co., and is about two miles distant from Coal Valley. It has a furnace for ventilation which was giving 8,000 cubic feet of air per minute when I was in the mine, and there was passing at the last break-through on the main entry 6,498 feet per minute. The general condition of the mine, both as to ventilation and drainage, with the exception of a few working faces that were too far in advance of the air current, was very good. The Excelsior mine, operated by the same company, was idle.

STRAUGHAN'S MINE,

Operated by the Straughan Coal Company, is located at Coal Valley, on the line of the Chesapeake and Ohio Railway. It is ventilated by furnace, and the quantity of air passed measured 8,200 cubic feet per minute, which was ample for the number of inside employes, but some of the working faces were further than they should have been from the air current, for good ventilation. The drainage was good.

COAL VALLEY MINE

Is situated at Coal Valley and is operated by the Coal Valley Coal Co. This mine is dependent on natural causes for ventilation, but it is nearly worked out; has several openings to the outcrop, and was in fair working order as to drainage and ventilation.

CANNELTON MINE

Is operated by the Cannelton Coal Company, and is situated on the north side of Kanawha river, opposite Coal Valley. Neither the ventilation, which was natural, nor the drainage was very good at the time of my visit, and I suggested a furnace for the mine. The coal is drawn by a locomotive, over a tramway, one-half mile long, from the mine to the head of the incline, thence it is lowered to the Kanawha river, ferried over to the south side of the river and shipped by rail. The Block mine, owned by the same company, was idle.

CRESCENT MINE

Is operated by William R. Johnson and is about a half mile above Coal Valley, on the Chesapeake and Ohio Railway . It has a good ventilating furnace six feet across the bars, four and a half feet high from bars to arch and eight feet long, with shaft and stack fifty-four feet high, and the condition of the mine both as to drainage and ventilation was good. It is quite a large mine and has two gravity incline planes on which the coal is lowered to the tipple on the Chesepeake and Ohio Railway. There is also a river tipple.

FAULKNER'S MINE

Is next above the Crescent Mine, on the Chesapeake and Ohio Railway, and is operated by Fredrick Faulkner. It has a furnace, but the stack was too low to give very good results, while some of the stoppings required repairing so as to conduct a larger proportion of the air to the head of the workings. There are two mines here in different seams, but the other mine known as Faulkner's No. 1, was not in operation. These mines have two tipples, one on the Chesapeake and Ohio Railway, and an excellent one on the Kanawha river.

EAGLE MINE

Is a short distance above Faulkner's Mine, and is operated by William Wyant. At the time of my first visit to this mine its condition both as to ventilation and drainage was very poor. It has a ventilating furnace but it was entirely incapable of passing the quantity of air required by the mines, and the air that it did give was not properly conducted through the workings. I notified the superintendent of the condition of the mine, directed that it be put in order, and offered such suggestions as I deemed necessary. On December 5, I again visited the mine and found the drainage much improved and the number of miners reduced to about forty, but some of the workings were still entirely too far in advance of the ventilation. A squeeze had been on some of the entry pillars and the condition of the mine was by no means good.

ST. CLAIR MINE

Is operated by the St. Clair Co., and is next above the Eagle mine. Ventilation is maintained by furnace and was fair at the time of my visit. The return airway however contained a good deal of fallen slate and needed cleaning out, so as to furnish less obstruction to the passage of air.

GREAT KANAWHA MINES, NOS. 1 AND 2.

Are about three and a half miles adove Coal Valley on the Chesapeake and Ohio Railway. No. 1 has not been in operation for about two years. No. 2 mine is operated by the Great Kanawha Colliery Company and is situated about three-fourths of a mile distant from the line of the Chesapeake and Ohio Railway. There is a three feet gauge railroad from the mine to the head of the incline plane, on on which a small locomative engine is used. A fire-basket has been fixed at the bottom of a shaft, for ventilating purposes, but it was not in use when I was at the mine and natural causes were depended on for producing a draught of air. The main door for directing the ventilation was down and in parts of the mine the ventilation was not good. The drainage was fair.

HAWKS NEST MINE

Is on a branch of Mill Creek, about three and a half miles from Hawks Nest Station on the Chesapeake and Ohio Railway, and is operated by the Hawks Nest Coal Co. In the working parts of the mine the ventilation was natural but was found to be fair. There is a furnace but it is used to venilate a gangway on which a mine locomotive is used. The coal is transported over a two and a half feet gauge railroad, on which a locomotive engine is used, from the mine to the tipple at Hawks Nest Station, where it is transferred to the Chesapeake and Ohio Railway cars or used for changing their copper coke ovens of which the company own eighty.

GAYMONT MINE.

This mine is on the line of the Chesapeake and Ohio Railway, one mile above Hawks Nest Station. A part of the mine is worked on the long-wall system while the other part is worked on the usual room pillar plan. It has a good furnace, with brick stack, and the ventilation was tolerably fair, but some of the doors and stoppings were leaky and needed repairing. It is operated by Joseph Pirrung.

SUNNYSIDE MINE

Is operated by Thomas & Lomax about one mile above Gaymont. It was not in operation for some time prior to December the 8th, when it was reopened by the present firm. It has a furnace for ventilation, which is used whenever natural causes fail to produce a sufficient current of air, and the mine was in very good working order.

ELMO MINE,

On the Chesapeake and Ohio Railway three miles above Hawk's Nest is operated by W. A. Burke & Company. It has a furnace of sufficient power for the force usually employed in the mine, but the system of working requires a great many doors, some of which had become leaky, and the air was not conducted in sufficient quantity to the head of the workings. The drainage was also badly in need of attention. The superintendent agreed to put the mine in order and I have since been reliably informed that he did so.

FAYETTE MINE

Is at Fayette Station on the Chesapeake and Ohio Railway, and the operators are William Masters & Son. The ventilation was natural and only tolerable. The drainage was by syphon and in part of the mine it was not good. The firm has lately built one dozen coke ovens at this mine.

NUTTALLBURG MINE

Is operated by the Nuttallburg Coal and Coke Company. It is ventilated by furnace which was passing 5,880 cubic feet per minute while I was in the mine. Another furnace was being built, which will be larger and more effective as a ventilator, and which I think will have ample power for the requirements of the mine. This mine was originally laid off and worked on the single entry plan, but the superintendent is now changing it to the double entry system for the purpose of more thorongh ventilation. The drum house of this mine was burned down last November, presumally by an incendiary, but it was promptly rebuilt

KEENYS CREEK MINE.

This mine is aboat one mile above the Nuttallburg mine on the Chesapeake and Ohio Railway, and is operated by the same company. There was no artificial means of producing an air current, and in a part of the mine the ventilation was not good. They were driving a heading to the out-crop for the purpose of building a furnace which the superintendent assured me it would be completed without delay.

CAPERTON MINE

Is operated by William Beury, Cooper & Company. This mine is dependent on natural ventilation, but headings have been driven entirely through the mountain in various directions and there are several outlets to the mine. Owing to the dip of the coal seam some of these outlets differ considerably in elevation and as a natural result, whenever the atmosphere in the mine differs materially in tempature from the out-side atmosphere, or whenever the wind blows from certain directions, there is a current of air passing through the mine. At the time of my visit the ventilation was fair except on one entry that required a break through nearer the face.

NEW RIVER MINE,

On the Chesapeake and Ohio Railway, about one fourth mile above the Caperton mine, is operated by the New River Coke Company. The mine is ventilated by furnace and the quantity of air passing, measures 9,000 cubic feet per minute. The mine was in fair working order.

SEWELL MINE.

This is quite an old mine, is nearly worked out, and will likely be abandoned within the next six or eight months. It is operated by the Longdale Iron Company. The ventilation is natural but it was quite fair, owing to causes similar to those mentioned in the description of the Caperton mine, there being headings driven in various directions, entirely through the hill. The drainage in parts of the mine was not good caused by a leaky roof, rendering good drainage in some places quite difficult.

A new mine has been opened in the lower or Fire Creek seam but only about five miners are employed in it as yet.

The company is now opening another new mine on Mann's Creek to which they are building a three feet gauge railroad, eight miles long, on which a locomotive engine will be used. They have 120 coke evens, and the entire out-put of the mines is coked for their blast furnaces at Longdale, Virginia.

FIRE CREEK MINE

Is on the Chesapeake and Ohio Railway, three miles above Sewell, and is operated by the Fire Creek Coal and Coke Company. A part of the mine has no artificial means of ventilation. The other part has a furnace through which there was passing 9,500 cubic feet of air per minute; but the ventilation was not good, some of the workings being too far in advance of the air courses, and of course there was not much ventilation in such places. The mine boss promised to drive the needed air courses without delay.

ECHO MINE,

Operated by William Beury, Cooper & Co., is on the line of the Chesapeake and Ohio Railway, one and a half miles above Fire Creek mine. The ventilation of this mine was not good. There was no furnace nor other artificial means of creating an air current, and some parts of the workings were too far in advance of such ventilation as resulted from natural causes. Notified the superintendent of the defective ventilation. He agreed to erect a furnace and put the mine in order. The irregularity of the coal seam in this mine makes it much more difficult to ventilate than mines usually are.

STONE CLIFF MINES, NOS. 1 AND 2,

Are operated by the Beury Coal and Coke Company, and are three and a half miles, by rail, east of Echo mine. No. 1 mine is worked in the Fire Creek seam, and No. 2 in the Sewell seam. The drainage in No. 1 mine was good, but the ventilation, which was by small furnace, was insufficient. In No. 2 mine the drainage was poor. The ventilation was natural though it was fair. These mines were lately operated by the Fayette Coal and Coke Company.

QUINNIMONT MINE,

On the Chesapeake and Ohio Railway, about ten miles east of Stone Cliff, is operated by the Quinnimont Iron and Coal Company. The drainage and ventilation of this mine were generally fair, though the latter was dependent on natural causes. The company owns a number of coke ovens and a blast furnace. The furnace has been idle for a year or two owing to the depression of the iron market.

STIRLING COLLIERY

Is operated by John Cooper & Co. This mine is situated on a switch railroad one mile long and connecting with the Blue Stone extension of the Norfolk and Western Railroad, one and a half miles West of Blue Stone Junction. Ventilation is maintained by a fan fourteen feet in diameter, which at the low speed of about forty revolutions per minute passed 25,080 cubic feet of air, measured at the fan. By increasing the speed, 35,000 or 40,000 cubic feet of air per minute could have easily been circulated through the mine, and there need be no lack of thorough ventilation. The fan is run as an exhaust, or in other words, is made to draw the air out of the mine. This mine is worked in the Pocahontas seam, measuring here nine feet, of which seven and one-half feet are worked, the remaining eighteen inches being left up for roof.

CASWELL CREEK MINE

Is on a branch railroad connecting with the Blue Stone extension of the Norfolk and Western Railroad, three and a half miles west of Blue Stone Junction. The operators are Freeman & Jones. They have a fan fourteen feet in diameter and similar to the one used at the Stirling colliery. The ventilation in parts of this mine was not good; some of the working faces being too far in advance of the air current, and some of the doors and stoppings were needing repairs.

RELIANCE MINE.

Is operated by William Booth & Co., and is one-fourth mile distant from the Caswell Creek mine. A fan twelve feet in diameter is used to ventilate the mine. It gave at sixty-three revolutions 33,390 cubic feet of air per minute. It is run as an exhaust and is not provided with the usual spiral case and expanding chimney. The mine consisted of two openings, which at the time of my visit (September 24th,) were not connected in the underground workings. In one of these, the ventilation was natural, but they were driving a heading to connect the workings, which was nearly completed. As soon as the connection could be made the entire mine was to be ventilated by the fan. This mine, as well as the last two preceding, is worked in the Pocahontas seam, which here averages eight feet in thickness, of which about one foot is left up for roof.

LIST OF FATAL ACCIDENTS IN 1885.

February 3d, in New River mine, Robert Roy, colored, knocked out a prop which he claimed was in his way, and was instantly killed by a fall of slate.

March 11th, in Elk Garden mine, No. 1, Frank Hersberger, age thirty-seven years, was killed by a fall of breast coal. He left a widow and four children.

March 17th, in New River mine, James Duggins, single, was instantly killed by a fall of slate in an old worked out and abandoned room.

March 27th, in Cannelton mine, William Arrington was killed by a fall of slate at the face of his room. He was married, and left a widow and four children.

March 30th, in Eureka mine, Henry Conley, married, was killed by a fall of draw slate. He left a widow and several children.

April 15th, in Fire Creek mine, Floyd Jones, colored, single, knocked the prop from under a piece of dangerous slate when it fell and instantly killed him.

May 13th, in Crown Hill mine, Frank Thomas was injured by a fall of slate and died in July. He was twenty-two years old and single.

May 20th, in Cedar Grove mine, W. B. Ferguson, single, was killed by a fall of slate. Cause: failure to sufficiently prop the roof.

May 26th, on the gravity incline plane at Kanawha mine, Felix Thomas, John Pritt and Tom Slaughter were killed in a runaway. They were riding up to the mine in the empty cars when the brake on the drum at the head of the plane became deranged, and the cars were drawn up the plane with fearful speed. When they found that the cars were uncontrollable, Felix Thomas, Tom Slaughter, John McAnally and ——— Marmoran jumped off, but the first two were killed and McAnally and Marmoran were injured. John Pritt remained on the car and was killed by the concussion at the head of the plane.

June 25th, in Harrison county mine, Joseph Weaver was killed by a fall of slate. Left a widow and one child.

September 18th, in Benwood Iron Works mine, William Honney and Christian Winnecke were killed by an explosion of fire-damp (corburetted hydrogen gas), and Jos. Hogh was badly burned and died two days afterwards. The mine was idle at the time, and it is supposed that a door had been left open, permitting the fire-damp to accumulate in a heading beyond. The men entered the mine for the purpose of bailing water, and without knowing that there was an accumulation of explosive gas, walked into it with open lights. Joseph Hogh was mine boss. He was a widower, fifty-eight years old, with seven or eight children. John Honney was thirty-five years old and married ; he left a widow and four or five children. Christian Winnecke was twenty years old and single.

September 29th, in Echo mine, John Ball was instantly killed by a fall of slate at the face of his room. He was thirty years old and left a widow.

———, in Mount Morris mine, David Bowan, married, sixty-seven years old, was injured by a fall of slate and he died in about two months afterward.

October 5th, in Atlantic mine, John Cavey, a miner, was killed by a fall of breast coal. He was hurt at 3 o'clock, P. M., and died at 6 P. M. on the same day. Was twenty-three years old and single.

October 5th, in Sehon mine, Burrel Williams, a boy twelve years old, was instantly killed by a fall of slate crushing his head.

October 6th, in Reliance mine, Henry Jones was killed by a fall of coal.

October 20th, in Stone Cliff mine, Carter Johnson, colored, single, was killed by a fall of slate in an abandoned and unfrequented part of the mine.

November 10th, in Stirling colliery, (Mercer Co.) Benjamin Bradley, eighteen years of age, was killed by a fall of coal.

November 20th, in New Haven mine, Thomas Duckworth, a boy sixteen years old, was instantly killed. He was at the foot of the slope when a car near the head of the slope broke loose and ran back, striking and killing him.

NOTE :—D. F. Richardson was found dead in a mine car in the Gaston mine. He was not an employe of the mine, but was looking for work, and his death is supposed to have resulted from heart disease.

Number of deaths reported from accidents inside the mines during the year (not including the death of D. F. Richardson	20
Number of deaths reported from accidents outside the mines	3
Total number of deaths from accidents in or about the mines during the year	23

LIST OF NON-FATAL ACCIDENTS IN 1885.

January 23d, at Crescent mine, (Fayette Co.) John Fields was crippled by flying coal from a car that had broken loose on the incline. Time lost, ten days.

April 10th, in Dana Brothers' mine, Robert Odell had his arm broken by being caught between the top of a car and the roof while driving.

April 23d, in Mountain Brook shaft mine, Adolphus Wein was burned about the hands and neck and face by firing gas.

May 9th, in Reliance mine, Edward English had his head hurt by a fall of coal.

May 8th, in Ocean mine, Charley Comer, John Whitehair, Clarence Helmick and Lee Dillon were burned by a blast from a shot. Charley Comer had his clothing set on fire, was seriously burned and had not fully recovered on 23d of October. They were boys who had remained in the mine after the usual working hours for the purpose of doing some extra work, when the accident occurred.

May 26th, at Kanawha mine, John McAnally and —— Marmoran were hurt on the incline plane as detailed in the list of fatal accidents under this date.

May —, in Caswell Creek Mine, Thomas Page had his leg broken by a fall of coal.

June 16th, in Dana Brothers' mine, George Owens was caught under a fall of slate in his room, his back seriously hurt and one of his legs was broken

June 23rd, in Crescent mine, (Fayette County) Charles Bibb was crippled by a fall of coal, mashing his knee. Time lost, twenty days.

August 2nd, in Davis mine, Stephen Bulger had his arm hurt by a rock from a blast. Time lost, six weeks.

August 18th, in Palatine mine, J. C. McKinney was hurt in the back by the fall of a piece of slate in his room. He lost ten days work.

August 18th, in Irondale mine, William Tunning was hurt by a fall of coal. He lost four weeks time.

September 9th, in Mountain Brook shaft mine, Henry Foster was burned on the neck and face by firing gas at the face of a heading after a shot.

October 5th, in Irondale mine, George Rowe had his fingers mashed, and lost three weeks time.

October 7th, at Stone Cliff mine, O. C. Kubach, the general manager had his foot run over by the monitor on the incline plane, and badly crushed.

October 20th, in Elk Garden mine, No. 1, John Terrel was hurt by being mashed in the hips.

October 22nd, in Irondale mine, Thomas Snyder was hurt in the back by a loaded car striking him. He lost four days time.

November 1st, in Moundsville shaft mine, Charles D. Guthrie was caught between a car and a rib of coal and his collar bone broken.

November 6th, in Moundsville shaft mine, John Andree was burnt by fire-damp in the face of a heading.

November 5th, in Atlantic mine, William Norman had his leg broken below the kneee by a fall of breast coal.

November 11th, at Perfection mine, Henry Smith a driver, was run over by a car on the tram road outside the mine, and had not fully recovered from the injury on December 10th.

November 21st, in Peabody mine, George Young was hurt by a fall of coal.

November 24th, in Crescent mine, (Fayette county) William Lette was crippled by a fall of coal. He lost sixty days from work.

November 25th, in Harrison county mine, Thos. Bodkins had his right arm crushed by a fall of coal in his room. The arm had to be amputated.

November 26th, in Hartford City mine, Edward Hunter was hurt by a fall of slate and lost one week from work.

December 1st, in Palatine mine, George L. Hall was accidently struck on the hand by a pick. He will lose probably sixty days from work.

December 2nd, in Eureka mine, Thomas Hogarth had his leg broken by a fall of coal.

December 7th, in Crescent mine, (Fayette county) Jas. Hope was crippled by a fall of coal. Time lost fourteen days.

December 23, in Dana Brothers' mine, John Myers had his jaw broken by a fall of coal, while making an under-cut.

SUMMARY OF ACCIDENTS DURING THE YEAR, REPORTED TO THE INSPECTOR.

Number of deaths from accidents inside the mines	20
Number of deaths from accidents outside the mines	3
Total number of deaths from accidents	23
Number of non-fatal injuries from accidents inside the mines	28
Number of non-fatal injuries from accidents outside the mines	5
Total number of non-fatal accidents	33

TABLE I.—*Showing Name and Postoffice Address of Collieries in the Northern Part of West Virginia.*

Name of Colliery.	Operator.	Superintendent.	Mine Boss.	Postoffice Address
Wellsburg Shaft	Diamond Coal & Coke Co	J. C. Cram		Wellsburg, Brooke county
Wellsburg Mines	Forbes, Carmichael & Co	William Forbes	J. W. Carmichael	Wellsburg, Brooke county
Short Creek	Jas. Cooper & Co	James Cooper	James Cooper	Short Creek, Brooke county.
Top Mills	Wheeling Iron & Nail Co	H. H Hornbrook	J. M. Hamilton	Wheeling, Ohio county
Fulton	Marshall, Van Fossen & Co			Wheeling, Ohio county
Elm Grove Shaft	W. T. Chambers & Co	W. T. Chambers	Frank Martin	Elm Grove, Ohio county
Manchester	Manchester Coal Co			Wheeling, Ohio county
Whitaker	Whitaker Iron Co	N. E Whitaker.	T. E. Kaseley	Wheeling, Ohio county
Crescent	Kaseley & Brooks	T. E. Kaseley	T. E Kaseley	Wheeling, Ohio county.
Belmont	Belmont Nail Co	Nicholas Reister	L Barum	Wheeling, Ohio county.
Riverside	Riverside Iron and Steel Co	F. J. Hearn	L. Schan	Wheeling, Ohio county
La Belle	La Belle Iron Works	Chris. Baker	Chris. Baker.	Wheeling, Ohio county
South Side	Kaseley & Brooks			Wheeling, Ohio county
La Grange	Kaseley & Brooks			Wheeling, Ohio county
Boggs Run	Boggs Run Mining & Manufact'g Co,	Philip Kunz	Philip Kunz	Benwood, Marshall county
Benwood Coal Works	Benwood Coal Works	Shepard Hoyt	S. Hoyt	Benwood, Marshall county.
Benwood Iron Works	Benwood Iron Works	F. Niedmeyer	Henry Riddle.,	Benwood, Marshall county
Moundsville Shaft	Moundsville Coal Co	W. B. Brooks	W. B. Brooks	Moundsville, Marshall county.
West Fairmont Shaft				Fairmont, Marion county.
Palatine	Newburg Orrel Coal Co	M. D. Orr	M. D. Orr	Fairmont, Marion county
Gaston	Gaston Gas Coal Co	J. E Watson	G H. Richardson	Fairmont, Marion county
New England	New Eng. & Fairmont Gas Coal Co.	R. D. Wilson	William Rennie.	Fairmont, Marion county.
Irondale	F. Nemegyei	A. C. Haley	G. Brown	Independence, Preston county
Mt. Brooks shaft	Newburg Orrel Coal Co	John Laxton	John Bratt	Newburg, Preston county
Newburg	Newburg Orrel Coal Co	Lawrence Henry	A. Dunsmore	Newburg, Preston county
Austen	Colgate & Co	C. Jessop	J. M. Whittaker	Austen, Preston county.
Armstrong	Big Vein Coal Co	James Little	James Little	Piedmont, Mineral county.
Atlantic	Atlantic & George's C'k Con. Coal Co.	L. T. DeWitt	John Jose.	Piedmont, Mineral county
Elk Garden No. 1	W. Va. Central & Pittsburgh R. R. Co.	A. C. Rawlins	William Byers.	Elk Garden. Mineral county
Elk Garden No. 2	W. Va. Central & Pittsburgh R. R. Co.			Elk Garden, Mineral county
Davis	H. G. Davis & Bro	James Brown	James Brown	Davis, Tucker county
Elk Garden No. 4	H. G. Davis & Bro	Owen Riordan	Owen Riordan	Thomas, Tucker county.
Flemington				Flemington, Taylor county
Tyrconnel	Newburg Orrel Coal Co	J. H. Henry	Robert Love	Tyrconnel, Taylor county
Ocean	Consolidated Coal Mining Co.	R. D. Wilson		Bridgeport, Harrison county.
Murphy's Run				Clarksburg, Harison county
Despard	Despard Coal Co.	Mord Lewis	J. Latstetter	Clarksburg, Harrison county
Harrison Co. Mines	Harrison Co. Coal Co	John Corpening	J. Corpening	Clarksburg, Harrison county
Pinnickinnick	T. P. Brannon & Co	T B. Brannon	B. D. Cox	Clarksburg, Harrison county
Wilsonburg				Wilsonburg, Harrison county
New Haven	New Haven Coal and Salt Co	Hugo Juhling	Thomas Jones	New Haven, Mason county.
Hartford City	Hartford City Salt Co	G. W. Moredock	T. E. Jones	Hartford City, Mason county
California	Juhling Coal Co	William Juhling.	J M. Hensley	Hartford City, Mason county

TABLE I—CONTINUED.—*Showing Name and Postoffice Address of Collieries in the Northern Part of West Virginia.*

Name of Colliery.	Operators.	Superintendent.	Mine Boss	Postoffice Address.
Sehon	C. A. Bettinger & Co	C. A. Bettinger	P. Bettinger	Hartford City, Mason county
Mosquito	Liverpool Salt Co.	Charles Clifton	J. Lillich	Hartford City, Mason County
German Furnace	German Coal and Salt Co	John Mees.	Charles Young	Mason City, Mason county
Hope	Hope Manufacturing Co	Edward Edwards		Mason City, Mason county
Sterling	W. E. Edwards	W. E. Edwards	Fred Powell	Clifton, Mason county
Clifton	Maxwell Manufacturing Co	Anthony Robson	Anthony Robson	Clifton, Mason county
Newcastle	Huggins & Co	G. W. Huggins	William Potts	Clifton, Mason county
Cmaden	Con. Coal and Mining Co	George Shears	John Gosney	West Columbia, Mason county

TABLE II.—*Showing Names and Postoffice Address of Collieries in Southern Part of West Virginia.*

Name of Colliery.	Operator.	Superintendent	Mine Boss.	Postoffice Address.
Energetic	Anderson & Short	D. L Anderson	Thomas Short	Energetic, Putnam county
Star	Marmet Mining Co	G. W. Cawley		Raymond City, Putnam county
Perfection No. 1	Black Band Iron and Coal Co	A. M. Woolridge	J D. Cavin	Spring Hill, Kanawha county
Perfection No. 2	Black Band Iron and Coal Co	A. M. Woolridge	J. D. Cavin	Spring Hill, Kanawha county
Daniel Boone	M P Norman	M P. Norman		Kanawha county
Pioneer No. 1	Pioneer Coal Co	J. J. Lovell	John Walton	Malden, Kanawha county
Pioneer No 2	Pioneer Coal Co	J. J. Lovell	W G. McDaniel	Malden, Kanawha county
Pioneer No. 4	Pioneer Coal Co	J. J. Lovell	J. T. Brown	Malden, Kanawha county
Boyce	Campbell's Creek Coal Co	J. E. Dana	J B. Lewis	Malden, Kanawha county
Calderwood	Campbell's Creek Coal Co.	J. E. Dana	Wm. Calderwood	Malden, Kanawha county
Dana Brothers	Dana Brothers	Geo. Dana	J. B. Lewis	Malden, Kanawha county
Beane's	Welton Coal and Salt Company	Mike Beane	M. Beane	Malden, Kanawha county
Dickinson	John Q Dickinson & Co			Malden, Kanawha county
Benington	W. S. Carkin	T. F. Holt	F. Clendenen	Carkin, Kanawha county
Winifrede No. 1	Winifrede Coal Co	R B. Cassady	James Morgan	Winifrede, Kanawha county
Winifrede No. 2	Winifrede Coal Co	R. B. Cassady	James Morgan	Winifrede, Kanawha county
Winifrede No. 3	Winifrede Coal Co	R. B. Cassady	James Morgan	Winifrede, Kanawha county
Macfarlane	Macfarlane Coal Co	G. Macfarlane	Mark Foster	Peerless, Kanawha county
Peerless	Peerless Coal Co	H. S. Holwood	Joseph Moore	Peerless, Kanawha county
Steven's Coal Co	Stevens Coal Co	F. L Garrison	J. S Holmes	Coalburg, Kanawha county
Coalburg No. 1	Robinson Coal Co	Neil Robinson	Robert Brabbin	Coalburg, Kanawha county
Coalburg No. 2	Robinson Coal Co.	Neil Robinson	Robert Brabbin	Coalburg, Kanawha county
East Bank	Stuart M. Buck	S M. Buck	G. W. Poff	Coalburg, Kanawha county
Blacksburg	William Sharpe	Wm. Sharpe	James McKelvie	Blacksburg, Kanawha county
North Coalburg	Lovell Coal Co	Jas. Clarkson	David Howry	Shrewsbury, Kanawha county
Peabody	Peabody Coal Co	Geo. W. Connel	J. J. Neylon	Peabody, Kanawha county
Cedar Grove	Cedar Grove Mining Co	J. G. W. Tompkins	B. F. Spruce	Cedar Grove, Kanawha county
Kelley's Creek	Cedar Grove Pure Coal Co	J. G. Durbin	John Thompson	Cedar Grove, Kanawha county
Crown Hill No. 2	Crown Splint Coal Co	Brewer Smith	J D. Lowther	Paint Creek, Kanawha county
Kanawha Cannel Coal	Kanawha Cannel Coal Co	J. C. Morrison	William R. Hall	Paint Creek, Kanawha county
Wyoming Nos. 1 and 2				
Kanawha	Kanawha Mining Co	G. L. Drouillard	Jamas Youall	Coal Valley, Fayette county
Union	Union Coal Co	Jas. Tubert	Ed Pinkney	Coal Valley, Fayette county
Mount Morris	Mount Morris Coal Co	Wm. Trudgen	Frank Love	Coal Valley, Fayette county
Carvers	Carver Brothers	John Carver	John Tasker	Coal Valley, Fayette county
Excelsior	M. T. Davis & Co	M. T. Davis		Coal Valley, Fayette county
Eureka	M. T. Davis & Co	M. T. Davis	George Frazier	Coal Valley, Fayette county
Straughan's	Straughan Coal Co	Geo. Straughan	John Straughan	Coal Valley, Fayette county
Coal Valley	Coal Valley Coal Co	Wm J. Davies	Mat. Perry	Coal Valley, Fayette county
Cannelton	Cannelton Coal Co	Henry Davis	Thomas Elliot	Cannelton, Kanawha county
Crescent	William R Johnson	T. A. Bartlam	John Perkins	Crescent, Fayette county
Faulkner's	Frederick Faulkner	F. Faulkner	John Young	Frederick, Fayette county
Eagle	William Wyant	William Wyant	J. C. Bostic	Eagle, Fayette county

TABLE II—CONTINUED.—*Showing Names and Postoffice Address of Collieries in Southern Part of West Virginia.*

Name of Colliery.	Operator.	Superintendent.	Mine Boss.	Postoffice Address.
St. Clair	St. Clair Co	William Wyant	Thomas Lloyd	Eagle, Fayette county
Great Kanawha	Great Kanawha Colliery Co	S. G. Phillips	S. Dixon	Mount Carbon, Fayette county
Hawk's Nest	Hawk's Nest Coal Co	S. M. Taylor	John Shearer	Ansted, Fayette county
Gaymont	Joseph Pirrung	Joseph Pirrung	J. Pirrung	Hawk's Nest, Fayette county
Sunnyside				
Elmo	W. A. Burke & Co	G. W. Hamilton	G. W. Hamilton	Elmo, Fayette county
Fayette	Wm. Masters & Son	Wm. Masters	William Stout	Fayette Station, Fayette county
Nuttallburg	Nuttallburg Coal and Coke Co	W. H. Holland	George Holland	Nuttallburg, Fayette county
Keeny's Creek	Nuttallburg Coal and Coke Co	W. H. Holland	William Horrocks	Nuttallburg, Fayette county
Caperton	Wm. Beury, Cooper & Co	J. L. Beury	W. A. Brown	Caperton, Fayette county
New River	New River Coke Co	F. Howald	R. B. Hanna	Caperton, Fayette county
Sewell	Longdale Iron Co	J. A. McGuffin	T. G. Burke	Sewell Depot, Fayette county
Fire Creek	Fire Creek Coal and Coke Co	F. Howald	James Lang	Fire Creek, Fayette county
Echo	Wm. Beury, Cooper & Co	J. L. Beury	J. Grisinger	Fire Creek, Fayette county
Stone Cliff No. 1	Beury Coal and Coke Co	O. C. Kubach	James Russell	Stone Cliff, Fayette county
Stone Cliff No. 2	Beury Coal and Coke Co	O. C. Kubach.	E. J. Toland	Stone Cliff, Fayette county
Quinnimont	Quinnimont Coal and Iron Co	S. B. Patterson	John McIntosh	Quinnimont, Fayette county
Stirling	John Cooper & Co.	John Cooper	Job Cooper	Cooper's, Mercer county
Caswell	Freeman & Jones	John Freeman	Jenkin Jones	Bramwell, Mercer county
Reliance	Wm. Booth & Co	J. P. Bowen	J. P. Bowen	Bramwell, Mercer county

TABLE III.—*Showing the Average Number of Inside Employes and Mode of Ventilation of Collieries in the Northern Part of West Virginia.*

Name of Colliery	Miners	Other Employes	Total Inside Employes.	No. Mules Inside.	Kind of Mine	Mode of Ventilation
Wellsburg Shaft					Shaft	Furnace.
Wellsburg Mine	20	4	24	2	Drift	Furnace.
Short Creek.	12	3	15	1	Drift	Natural.
Top Mill	14	4	18	3	Drift	Furnace.
Elm Grove Shaft	35	3	38	1	Shaft	Steam Jets
Whitaker	9	6	15	4	Drift	Fan
Belmont	15	3	18	2	Drift.	Furnace
Riverside	20	6	26	5	Drift	Furnace.
La Belle	15	4	19	8	Drift	
Bogg's Run	18	6	24	5	Drift	Furnace
Moundsville Shaft.	80	9	89	5	Shaft	Fan.
West Fairmont Shaft.						
Palatine	30	9	39	8	Drift	Natural.
Gaston	70	16	86	16	Drift	Steam Jets
New England	40	7	47	4	Drift.	Natural
Irondale.	40	11	51	7	Slope	Heat from Pump
Mountain Brook Shaft	18	6	24	3	Shaft	Ex'st Steam from Pump.
Newburg.	50	9	59	6	Drift	Natural
Austen	29	12	41	9	Drift	Furnace and Natural
Armstrong	81	6	87	5	Drift.	Natural
Atlantic.	85	7	92	5	Drift.	Natural
Elk Garden, No. 1	257	18	275	16	Drift	Furnace
Elk Garden, No. 2						
Davis	9	2	11	1	Drift	Natural
Elk Garden, No. 4					Drift	Natural
Flemington						
Tryconnel	40	7	47	8	Drift	Natural
Ocean	30	7	37	6	Drift	Natural
Despard	50	16	66	6	Drift	Natural
Harrison county	13	2	15	2	Drift.	Natural.
New Haven	40	5	45	4	Slope	Furnace.
Hartford City	26	12	38	8	Slope	Furnace.
California	31	4	35	2	Slope	Furnace.
Sehon	33	6	39	4	Drift	Furnace
Mosquito	14	3	17	3	Drift.	Furnace
Sterling	30	7	37	7	Drift	Furnace.
Clifton.	20	3	23	2	Drift	Furnace
New Castle	18	4	22	2	Drift	Natural
Camden	58	15	73	12	Drift	Furnace
Totals	1,350	242	1,592	177		

TABLE IV.—*Showing the Average Number of Inside Employes and Mode of Ventilation of Collieries in the Southern Part of West Virginia.*

Name of Colliery.	Miners	Other Employes	Total Inside Employes	No. Mules Inside.	Kind of Mine.	Mode of Ventilation.
Energetic	10	3	13	2	Drift	
Star	65	22	87	4	Drift	
Perfection No. 1	50	7	57	4	Drift	Furnace
Perfection No. 2	45	4	49	2	Drift	Furnace
Pioneer No 1	65	12	77	6	Slope	Furnace
Pioneer No. 2	45	10	55	5	Slope	Furnace
Pioneer No. 4	18	3	21	1	Slope	Natural
Boyce	85	19	104	25	Slope	Furnace
Calderwood	95	29	124	34	Drift	Furnace
Dana Brothers	100	22	122	17	Slope	Furnace
Beane's	55	10	65	8	Slope	Furnace
Benington	26	6	32	5	Drift	Steam Jets
Winifrede No. 1	96	10	106	8	Drift	Furnace
Winifrede No 2	86	8	94	4	Drift	Furnace
Winifrede No 3	16	3	19	2	Drift	Furnace
Macfarlane's	50	7	57	3	Drift	Natural
Peerless	70	8	78	5	Drift	Natural
Steven's Coal Co	19	3	22	1	Drift	Nat'l and by fire basket.
Coalburg No 1	85	12	97	7	Drift	Natural
Coalburg No 2	45	3	48	2	Drift	Natural
East Bank	30	7	37	4	Drift	Furnace
Blacksburg	35	5	40	2	Drift	Fire Basket
North Coalburg	30	6	36	4	Drift	Natural
Peabody	48	6	54	3	Drift	Furnace
Cedar Grove	70	7	77	5	Drift	Furnace and Natural
Kelly's Creek	35	10	45	2	Drift	Furnace
Crown Hill	106	15	121	10	Drift	Furnace
Kanawha Cannel Coal	60	11	71	7	Drift	Furnace
Kanawha	100	16	116	9	Drift	Furnace
Union	50	7	57	4	Drift	Natural
Mount Morris	40	9	49	7	Drift	Natural
Carvers	35	9	44	5	Drift	Fire Basket
Eureka	60	9	69	7	Drift	Furnace
Straughan's	40	8	48	5	Drift	Furnace
Coal Valley	25	6	31	4	Drift	Natural
Cannelton	95	16	111	11	Drift	Natural
Crescent	74	20	94	14	Drift	Furnace
Faulkner's	45	13	58	9	Drift	Furnace
Eagle	85	16	101	12	Drift	Furnace
St. Clair	28	5	33	2	Drift	Furnace
Great Kanawha	45	7	52	5	Drift	Natural
Hawk's Nest	60	8	68	6	Drift	Natural
Gaymont	30	5	35	3	Drift	Furnace
Elmo	30	3	33	2	Drift	Furnace
Fayette	40	6	46	2	Drift	Natural
Nuttallburg	70	13	83	12	Drift	Furnace
Keeny's Creek	50	8	58	6	Drift	Natural
Caperton	120	15	135	13	Drift	Natural
New River	87	14	101	10	Drift	Furnace
Sewell	55	16	71	12	Drift	Natural
Fire Creek	140	21	161	14	Drift	Furnace and Natural
Echo	51	8	59	5	Drift	Natural
Stone Cliff No. 1	40	6	46	2	Drift	Furnace
Stone Cliff No. 2	40	5	45	3	Drift	Natural
Quinnimont	42	6	48	4	Drift	Natural
Stirling	100	9	109	5	Drift	Fan
Caswell	60	8	58	4	Drift	Fan
Reliance	53	4	57	2	Drift	Fan
Totals in the Southern part of the State	3,330	564	3,894	381		

	Miners.	Other Employes.	Total Inside Employes.	No. Mules Inside.
Totals in the Southern part of the State	3,330	564	3,894	381
Totals in the Northern part of the State	1,350	242	1,592	177
Totals of the State	4,680	806	5,486	558

THE COAL PRODUCTION OF THE WORLD.

(From the Coal Trade.)

"We have tabulated the following schedule from the best sources, and the figures may be taken as essentially correct:"

COUNTRIES.	Square miles of Coal Area.	Tons 1870.	Tons 1882.	Tons 1883.	Tons 1884.
Great Britain	11,900	110,431.192	156,499,977	163,737,327	160,757,779
United States	192,000	32,863,690	86,849,846	96,975,385	99,851,807
Germany	1,770	34,003,004	65,333,925	66,870,634	63,945,416
France	2,086	13.179,708	20,803,332	21,270,533	21,334,000
Belgium	510	13,697,118	17,590,989	18,177,754	18,051,499
Austria	1,800	8,355,944	17,000,000	17,000,000	17,199,517
Russia	30,000	829,745	3,600,000	4,000,000	4,200,000
Spain	3,501	661,927	900,000	9,000,000	900,000
Nova Scotia	300	625.769	1,365,811	1,422,553	1,389,295
Australia	24,840	868.564	2,109,282	2,521,457	2,749,109
India	2,000	500,000	4,000,000	4,000,000	4,000 000
Japan	5,000	....	800,000	900,000	900,000
Vancouver's Island	390	29,863	284,000	216,184	394,070
New Zealand	....	....	378,272	421,764	462,590

COAL PRODUCTION IN 1885.

The following estimate of the coal production has been carefully made from the most reliable data obtainable, and it is believed that it does not differ materially from the true amount. An effort was made to obtain from each operator a statement of the out-put of his mine, but in several cases such statements were not furnished. The pooduction of such mines as failed to report have however been eatimated and included in the totals.

There are a number of small mines in the state emoloying about ten or less miners each, from which the returns were too meager to make even an *estimate* of their production and they were not considered in the calculation.

	Tons (2,240℔).	
Out-put of mines on the W. Va C. & P. R R	400,035	
Out-put of the other mines in the northern part of the State, including the mines of Mason county	645,500	
Total out-put of the northern part of the State		1,045,535
Out-put of the Flat Top (Mercer Co.) mines	147,484	
Out-put of the Kanawha and New river mines	1,815,072	
Total out-put of the southern part of the State		1,962,556
Total		3,008,091

COKE PRODUCTION IN 1885.

Coke produced in the northern part of the State	54,671
Coke produced in the southern part of the State	112,846
Total	167,517

COAL AND COKE SHIPPED OVER THE CHESAPEAKE AND OHIO RAILWAY DURING 1885.

The following is an official statement of the coal and coke tonnage of the Chesapeake and Ohio Railway during the year:

Kind of Coal.	Tons
Cannel	29,260
Gas	298,251
Splint and Block	101,315
New River	526,182
Total quantity of coal	965,008
Coke	112,843
Total quantity of coal and coke	1,077,851

COAL PRODUCTION OF THE UNITED STATES.

The following is copied from *The Coal Trade*, published by F. E. Saward, editor of *The Coal Trade Journal*, New York:

"The figures below are authentic, and fairly represent so many gross tons; while the returns from certain States are made in net tons there is always a large amount of coal used by local industries, the mining population, railroads in the districts, county banks for farmers' use, small mines that are not under the mine inspectors' regulations, and in fact a vast amount of supply coal that never gets into the returns. In the item of anthracite we have given here the shipments or commercial coal only."

	1884.	1885.
Alabama	2,000,000	2,225,000
Arkansas	150,000	175,000
California	200,000	150,000
Colorado	1,200,000	1,350,000
Dakota	50,000	75,000
Georgia	200,000	200,000
Idaho	20,000	40,000
Illinois	10,101,005	9,791,874
Indiana	2,260,000	2,375,000
Indian Territory	400,000	500,000
Iowa	3,903,458	3,585,737
Kansas	1,100,000	1,300,000
Kentucky	1,550,000	1,700,000
Maryland	2,469,051	2,462,485
Michigan	135,000	130,000
Missouri	2,500,000	2,750.000
Montana	50,000	75,000
New Mexico	220,557	306,207
Ohio	9,000,000	9,000,000
Oregon	60,000	100,000
Pennsylvania, anthracite	30,718,293	31,623,529
Pennsylvania, bituminous	25,000,000	25,000,000
Tennessee	1,200,000	1,440,597
Texas	125,000	175,000
Utah	250,000	250,000
Virginia	300,000	650,000
Washington Territory	380,698	410,667
West Virginia	3,000,000	3,483,457
Wyoming Territory	1,000,000	900,000
Totals	99,543,062	102,224,553